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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
TESKIN, FRED M	
ART UNIT	**PAPER NUMBER**
1713	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/555,472	KONIG ET AL.	
	Examiner	Art Unit	
	Fred M. Teskin	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-27 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-3,5,7,9,11-19 and 22-27 is/are rejected.

7)☒ Claim(s) 4,6,8,10,20 and 21 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 02 November 2005 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 20051102.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

The preliminary amendment of November 2, 2005 having been entered, claims 1-27 are currently pending and under examination herein.

The references cited in the Search Report of September 21, 2004 have been considered; however, though designated an "X" category document, the cited DE '541 patent is not being applied in any rejection herein, since it is apparent from review of the corresponding US patent that the document does not contemplate polymerization of vinyl monomers in an apparatus with a driven *central spindle or screw* and therefore cannot teach or suggest the "planetary roller extruder" limitation of claim 1, as defined herein (e.g., page 3, first paragraph of the specification).

Claim 4 is objected to because of the following informalities: the word "roll" should read –roller- for consistency in terminology (*cf.*, claim 1, final line). Appropriate correction is required.

Claims 5, 7 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(A) Claim 5 is indefinite due to lack of adequate and proper antecedent basis for the recitation "the preferred feed pump" (see the final line). Further, in view of the "preferred" introductory term, it is unclear whether said pump is intended to represent

essential or exemplary subject matter. Clarification and appropriate correction are required.

(B) Claims 7 and 9 each provide the limitation to "the initiators". There is inadequate antecedent basis for this limitation in the claims.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3, 11, 12, 14, 18, 19 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5510073 to Kaegi et al ("Kaegi"), in view of the evidence provided by Billmeyer, Jr. et al.

The claimed invention is a method for the continuous polymerization of vinyl monomers to vinyl polymers, wherein the polymerization takes place in a planetary roller extruder.

Kaegi discloses a multiple-screw extruder with planetary gear and its use in a method of processing and treating high-viscosity media (see Fig. 1, col. 1, lines 15-19; col. 4, lines 64+).

Polymerization of vinyl monomers in the planetary gear extruder, while not specifically disclosed, is nevertheless suggested by Kaegi. Thus at column 5, lines 25+, Kaegi advises that his invention "allows for a chemical reaction ... to be performed in the processing chamber". As shown in Fig. 2, the planetary gears of Kaegi are positioned at the beginning and end of the processing chamber (12). Kaegi then identifies preferred chemical changes as one of polymerization, polycondensation or a *polyaddition reaction*. The chemical changes may be brought about by introduction of gaseous or liquid components into the intake section *or the processing chamber* (col. 5, lines 41-43). As such, Kaegi would have taught those skilled in the art of the utility of a planetary gear multiple-screw extruder for conducting polymerization and polyaddition reactions.

Inasmuch as vinyl polymers are traditionally made by a polyaddition reaction of vinyl monomers, i.e., addition polymerization as evidenced by Billmeyer, Jr. (see generally pages 280-284), it would have been obvious to one of ordinary skill in the art to perform that reaction in the Kaegi extruder by polymerizing vinyl monomers in the processing chamber thereof. The expectation of thereby achieving continuous

production of vinyl polymer would have provided the requisite motivation to modify Kaegi so as to produce the claimed invention.

As to claim 3: non-addition of solvent during vinyl monomer polymerization in the Kaegi extruder would have been obvious since that extruder is taught to be particularly suitable for continuous processing of high-viscosity media (col. 4, lines 53-55 and col. 5, lines 22-24), which would have suggested to those of ordinary skill the dispensability of a polymerization solvent; i.e., a bulk polymerization.

As to claim 26: freeing the vinyl polymers from their volatile constituents in-line is understood to include the provision of degassing means for the planetary roller extruder. This feature is taught by Kaegi, see, e.g., column 7, lines 25-29.

Regarding claims 11, 12, 18, 19, 24 and 25, the recitation of an amount of "0 (zero) ... % by weight" renders these claims readable on the applicants' process as defined in claim 1.

Claims 1, 3, 7, 9, 11-14, 18, 19, 22-26 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6288162 to Leugs et al ("Leugs") in view of Kaegi.

Leugs discloses a continuous process for preparing polymer-based pigments, the process including the steps of: introducing continuously into an extruder defined amounts of monomer(s), initiator(s) and chain transfer agent; simultaneously mixing the introduced components and (co)polymerizing the monomer(s) within the extruder; and withdrawing continuously the obtained reaction product from the extruder (col. 1, line 50

to col. 2, line 9). Vinyl-type monomers are employed as per column 2, line 58 to column 3, line 44. Premixing of vinyl monomer(s) with a cooled mixture of initiators and chain transfer agent prior to introduction of the mixture into a co-rotating twin screw extruder is demonstrated, see Examples 1-3. The specific initiators employed are organic peroxides as detailed at column 3, line 58 to column 4, line 5.

Leugs differs from the claimed invention essentially in that the (co)polymerization reaction of Leugs does not occur in a planetary roller extruder.

However, Leugs provides for the use of any kind of extruder and expresses preference for co-rotating, closely intermeshing extruders (col. 4, lines 57-60).

Since Kaegi teaches a multiple screw extruder with planetary gear that are co-rotating and closely intermeshing (as per col. 6, lines 35-39 and col. 7, line 30), it would have been regarded by one of ordinary skill as a suitable extruder for performing the process of Leugs. This is especially true when considering Kaegi's suggestion to perform polymerization and polyaddition reactions in the processing chamber of his extruder.

Because the Kaegi extruder possesses the very features that characterize the preferred extruder of Leugs, it would have been obvious to one of ordinary skill in the art to perform the continuous process of Leugs utilizing the Kaegi extruder, and thereby produce the instantly claimed invention.

Claims 1-3, 11-19, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6506447 to Hirsch et al ("Hirsch"), in combination with Kaegi.

Hirsch discloses a process whereby pressure-sensitive self-adhesive compositions based on non-thermoplastic elastomers can be produced continuously without solvent and can be applied in-line to web-form carrier material (col. 6, lines 41-47 and col. 9, lines 36+). The process employs a continuously operating apparatus having a filling section and a compounding section. Solid components of the self-adhesive composition, such as elastomers and resins, are fed into the former section and a homogeneous, self-adhesive composition prepared in the compounding section (col. 6, line 54 to col. 7, line 5). As the continuously operating apparatus, a planetary roll extruder is said to be particularly advantageous to use (col. 7, lines 15+).

Hirsch differs from the claimed invention in that a polymerization reaction does not take place in the planetary roll extruder disclosed therein.

However, the potential of using a multiple screw extruder with planetary gear to conduct polymerization and polyaddition reactions is recognized by Kaegi as noted in the preceding rejections. In addition, Kaegi identifies as further applications using his inventive extruder, the mixing or compounding of polyolefins and polystyrene and copolymers based thereon (cols. 7-8, bridging paragraph).

In Hirsch, the non-thermoplastic elastomers are advantageously selected from specific synthetic rubbers as enumerated in column 11, lines 46+. Almost all of the listed rubbers (excepting polyurethanes) are the products of addition polymerization of vinyl monomers such as styrene. Accordingly, in view of the teachings of Kaegi, one would have expected such polyaddition reactions to be successfully performed in a planetary gear extruder.

Moreover, the practical benefits of eliminating a separate reaction step would have provided ample incentive to prepare and compound the synthetic rubber component of the Hirsch composition in the planetary roll extruder. Thus, at the time of applicants' invention, it would have been obvious to one of ordinary skill in the art to modify the method of Hirsch by utilizing the planetary roll extruder thereof to conduct the polymerization of vinyl-type monomers via a polyaddition reaction as taught by Kaegi.

The prior art made of record and not relied upon is considered pertinent to applicants' disclosure.

Weihrauch et al is pertinent to the preparation of urethane (meth)acrylates in extruders such as planetary extruders (note paragraph 0015). The reaction is indicated to occur *without (partial) polymerization* of the (meth)acrylate double bonds occurring (paragraph 0007).

Claims 4 and 5 would be allowable if amended or rewritten to overcome the objection and rejection under 35 U.S.C. 112 set forth in this Office action and to include all the limitations of the base claim and any intervening claim.

Claims 6, 8, 10, 20 and 21 are objected to as being dependent on a rejected base claim but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claim.

Any inquiry concerning this communication should be directed to Examiner F. M. Teskin whose telephone number is (571) 272-1116. The examiner can normally be reached on Monday through Thursday from 7:00 AM - 4:30 PM, and can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The appropriate fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

FMTeskin/09-30-06

FRED TESKIN
PRIMARY EXAMINER
1713